

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. **(Currently Amended)** An apparatus for detecting vulnerable plaque within a lumen defined by an intraluminal wall, the apparatus comprising:

a probe that resiliently assumes a preferred shape, the probe having

an optical fiber extending therethrough, and

an atraumatic light-coupler in ~~[contact with]~~ optical communication with the optical fiber, the coupler being disposed ~~[configured]~~ to atraumatically contact the intraluminal wall when the probe resiliently assumes the preferred shape ~~[at a point at which light exits the atraumatic light coupler and enters the wall]~~;

a light source in optical communication with the fiber for illuminating the wall; and

a detector in optical communication with the fiber for detecting light from within the wall.
2. **(Previously presented)** The apparatus of claim 1, wherein the probe further comprises a jacket enclosing the fiber.
3. **(Previously presented)** The apparatus of claim 2, wherein the jacket comprises a coil-wire wound into a coil-wire jacket.

4. **(Previously presented)** The apparatus of claim 3, wherein the jacket comprises a coil wire having a variable diameter.
5. **(Previously presented)** The apparatus of claim 1, wherein the probe comprises a plurality of optical fibers.
6. **(Cancelled)**
7. **(Currently Amended)** The apparatus of claim 1 [6], wherein the preferred shape comprises a bow.
8. **(Currently Amended)** The apparatus of claim 1 [6], wherein the preferred shape comprises an arc.
9. **(Currently Amended)** The apparatus of claim 1 [6], wherein the preferred shape comprises a portion of a catenary curve.
10. **(Previously presented)** The apparatus of claim 1, wherein the atraumatic coupler is disposed at a distal tip of the probe.
11. **(Previously presented)** The apparatus of claim 10, wherein the atraumatic coupler comprises a lens attached to the distal tip of the optical fiber.
12. **(Previously presented)** The apparatus of claim 10, wherein the atraumatic coupler is integral with the optical fiber.
13. **(Previously presented)** The apparatus of claim 12, wherein the atraumatic coupler comprises a distal tip of the optical fiber.
- 14-19. **(Cancelled)**
20. **(Previously presented)** The apparatus of claim 1, wherein the light source comprises a near infrared light source.

21. **(Previously presented)** The apparatus of claim 1, further comprising a processor in data communication with the detector, the processor being configured to identify a vulnerable plaque on the basis of a signal provided by the detector.

22-42. **(Cancelled)**

43. **(Original)** A method of detecting vulnerable plaque within an intraluminal wall, the method comprising:

placing an atraumatic light coupler in contact with the intraluminal wall;

passing light through the intraluminal wall by way of the atraumatic light coupler;

receiving light from within the intraluminal wall by way of the atraumatic coupler; and

providing the received light to a processor for analysis to identify the presence of a vulnerable plaque.

44. **(Original)** The method of claim 43, wherein placing an atraumatic light coupler in contact with the intraluminal wall comprises placing a distal end of a probe in contact with the intraluminal wall.

45. **(Cancelled)**

46. **(Currently Amended)** An apparatus for detecting vulnerable plaque within a lumen defined by an intraluminal wall, the apparatus comprising:

a probe that resiliently assumes a preferred shape, the probe having

an optical fiber extending therethrough, and

means for atraumatically contacting the intraluminal wall, the contacting means being in

~~[contact]~~ optical communication with the optical fiber and ~~[including means for~~

~~providing optical communication with]~~ being disposed to contact the intraluminal wall when the probe assumes the preferred shape;

a light source in optical communication with the fiber for illuminating the wall; and

a detector in optical communication with the fiber for detecting light from within the wall.

47. **(Previously presented)** The apparatus of claim 46, wherein the means for atraumatically contacting the intraluminal wall comprises a rounded surface at a distal tip of the probe.
48. **(Previously presented)** The apparatus of claim 47, wherein the rounded surface comprises a surface of a lens attached to the fiber.
49. **(Previously presented)** The apparatus of claim 48, wherein the means for providing optical communication comprises the lens.
50. **(Previously presented)** The apparatus of claim 47, wherein the rounded surface comprises a surface of the fiber.
51. **(Previously Presented)** The apparatus of claim 46, wherein the means for providing optical communication comprises the fiber.
52. **(Cancelled)**
53. **(Previously presented)** The apparatus of claim 52, wherein the means for providing optical communication comprises a reflective surface in optical communication with the side-window and with a face of the fiber.
54. **(Previously presented)** The apparatus of claim 52, wherein the means for providing optical communication comprises an angled face of the fiber.

55. (Previously presented) The apparatus of claim 52, wherein the means for providing optical communication comprises a diffraction grating in optical communication with the side-window and with the fiber.
56. (New) The apparatus of claim 1, wherein the atraumatic light-coupler is in contact with the optical fiber.
57. (New) The apparatus of claim 1, wherein a surface of the atraumatic light coupler is in contact with the optical fiber.
58. (New) The apparatus of claim 1, wherein the atraumatic light-coupler is disposed at a distal tip of the probe.
59. (New) The apparatus of claim 1, wherein the atraumatic light coupler is disposed along a side of the probe.
60. (New) The apparatus of claim 1, wherein the atraumatic light coupler contacts the wall at a point at which light exits the atraumatic light-coupler and enters the wall.
61. (New) The apparatus of claim 1,

wherein the atraumatic light coupler contacts the wall at a point at which light exits the atraumatic light-coupler and enters the wall, and

wherein a surface of the atraumatic light coupler is in contact with the optical fiber.